

Three Hundred Years of Demography

ALTHOUGH CENSUS-TAKING and the keeping of records of births, marriages and deaths are of great antiquity, these particulars were collected in the early days for practical purposes such as taxation and the establishment of legal title to property, and not in order to study population for its own sake; and although there was philosophical speculation about population questions in ancient times, it was unaccompanied by any numerical investigation. It was not until the year 1662 that anyone went so far as to analyse some vital statistics in order to see what they revealed, or to pursue speculation about population to the point of making quantitative estimates. In that year the Englishman, John Graunt, published his book, *Natural and Political Observations . . . upon the Bills of Mortality*, and in so doing became the founder of two sciences; statistics and demography. By drawing up the first life table, he was also one of the originators of actuarial technique.

The tercentenary of this remarkable beginning has recently been celebrated in various ways: for instance, articles on Graunt and his work have appeared in a number of publications. A special dinner was eaten, in a City Livery Company Hall, by leading scientists and insurance men. Above all, the Royal Society held a two-day Symposium in honour of Graunt, who was indeed one of its first Fellows; the meetings were organized by two Fellows of the Eugenics Society: Dr. P. B. Medawar, F.R.S., and Professor D. V. Glass. Ten papers were read and some of them touched upon eugenic subjects, although the main interest was demographic.

Here is a complete list of the papers in the order in which they were read:

John Graunt and His work (Professor D. V. Glass);

Actuarial Methods of Mortality Analysis (Dr. B. Benjamin);

Some recent trends in Public Health (Professor J. N. Morris);

The bearing of Demography on the study of Fecundity (Dr. L. Henry);

Genetical aspects of Human Infertility (Professor L. S. Penrose);

Genetical Demography (Professor K. Mather);

Concepts of Random Mating and the Frequency of Consanguineous Marriages (Dr. J. Hajnal);
Factors associated with Age at Marriage in Britain (Professor E. Grebenik and Miss Griselda Rowntree);

Demographic Aspects of Mental Disorder (Sir Aubrey Lewis);

Norms for Family Size in Underdeveloped Areas (Professor R. Freedman);

There was a discussion on each paper and at the end of the Symposium Professor F. W. Notestein made a closing statement which was also discussed.

Glass's very interesting account of Graunt's life disclosed some new facts uncovered by his recent researches in addition to giving a clear survey of existing knowledge. Born in 1620, the oldest child of seven or more in the family of a city haberdasher, Graunt was himself apprenticed at the age of sixteen into the same trade. He rose rapidly, and held many civic (and military) offices; he acquired considerable culture, moved in a distinguished circle and, after the appearance of his book, was elected to the recently-formed Royal Society.

Bills of Mortality were weekly statements usually showing the sex of each deceased person, and giving some indication as to age and cause of death; they exist for 1592-95 and for the years from 1603 onwards. Graunt analysed these lists in a critical way, by no means accepting all they showed, and drew from them far more than a count from time to time of the numbers of the deceased in each area. With their aid he estimated the size and trend of population, and the distribution of people according to the lengths of their lives; he took an interest in births, marriages, migration and statistics of households.

At the time of the Great Plague and Great Fire, Graunt apparently suffered financial and other losses, and soon retired; he died in 1674 after a period of hard times. He did not publish any other significant work. It may well be that his lack of a formal education, his practical training and his capable mind are responsible for his work, so original in its day and pregnant for

the future of man's scientific interests and achievements.

In the discussion following the reading of Professor Glass's paper, Mr. M. E. Ogborn—the Joint Actuary of the oldest Society to transact scientific life assurance, whose bi-centenary fell in 1962—drew attention to an exhibition of old prints and documents which was then being displayed in the Royal Society's Library.

Dr. Benjamin is one of the Chief Statisticians of the General Register Office and in his contribution he was able to give a comprehensive survey of methods of demographic analysis of mortality and their development in recent years. He paid a tribute to those who had brought about significant advances in the study of the subject since Graunt's time, and in particular to William Farr, who had himself addressed the Royal Society in 1849. Dr. Benjamin also wrote an article entitled "Measuring the World's Population Explosion" which appeared in the *New Scientist* for November 1, 1962.

In the discussion on Dr. Benjamin's paper, Mr. R. E. Beard outlined the course of some current research in which he seemed likely by an ingenious process of analysis to account for the trend of mortality from lung cancer, in terms of variations in the proportion of smokers and in the average amount smoked, including an explanation of sex-differences in this respect.

Professor J. N. Morris, of the Medical Research Council's Social Medicine Research Unit, said there was evidence that coronary thrombosis and lung cancer had reached their peak as causes of death in the middle-aged male population. Optimism that saturation point had been reached in these two important and serious diseases was justified because of the apparent stabilization of the incidence of lung cancer in men under sixty and the fact that there was no increase of coronary thrombosis among doctors, whose figures had been the highest.

Professor Morris examined trends in mortality in infancy, adolescence, middle life and old age. It was disappointing, he said, that there had been no appreciable fall in infant mortality in spite of twelve years of the National Health Service and that there had been no narrowing

of the proportionate differences in these rates between social classes for the past fifty years. The working classes made less use of the health service, reported pregnancies later, and used the Hospital Services less than the others. Britain was behind Holland and Sweden in reducing infant mortality. Professor Morris said that figures for chronic sickness of men in their sixties had been rising steadily since 1951. He believed that there should be more study of disease in relation to social patterns and conditions.

Dr. Louis Henry was not able to be present at the Symposium, but his paper was read in his absence. He has been responsible for many ingenious developments in the statistical study of fertility, and on this occasion was showing how population and registration statistics may be used in the measurement of fecundity. Dr. Henry considered that differences in fecundity may well exist between populations as well as between individuals; variations in social behaviour patterns, e.g. in the length of the lactation period and in periodic taboos on intercourse, have an important effect even where contraception is practised.

Professor Penrose's study of the genetical aspects of human infertility was concerned with the inheritance of particular defects in the reproduction system, while Professor Mather was concerned with the wider, statistical aspects of population genetics. Both emphasized the difficulty of assessing gene-frequencies in a group of people and the importance of genetic studies of large samples of human populations. In a stimulating discussion, the subjects touched upon included the rate of foetal mortality and the problem of apparent correlations between family size and intelligence. Dr. Wallis Taylor, of Manchester University, made the interesting suggestion that genetical information should be collected at the next national census. He suggested, for example, that it would be of value to know the total number of sons and daughters of the father of each family (thus giving the sex-ratio) and that a tally of information on blood-groups (where they were known) would also be useful.

After an interesting analysis by Dr. J. Hajnal of the prospects of consanguineous marriages in

random mating, in which he constructed some statistical models showing the expected frequency of cousin marriages, Professor Grebenik gave some of the preliminary results of a marriage survey he organized with Miss Griselda Rowntree three years ago. In an attempt to identify major social factors in the lowering of the age at marriage, 3,000 men and women between the ages of sixteen and fifty-nine—some married, some not—were interviewed on a national scale by a poll organization. Among the findings were that the brides of professional and managerial men continued to marry at later ages than those of other men, and that in recent years the marriage age of daughters of professional men had fallen more sharply than that of other sections of the population.

The survey also showed that 41 per cent of daughters of non-manual families marry sons of manual workers, and 27 per cent of the daughters of manual families marry sons of non-manual workers. Pre-nuptial conceptions were most prevalent when both parties were from manual families, and in the unions of women of manual families with non-manual men. Lengths of engagements appeared no shorter in the 1950s than in the 1930s. Professor Grebenik said that in his view the knowledge of the possibility of limiting the fecundity in marriage had had greater influence than anything else on the lowering of the marriage age.

Sir Aubrey Lewis discussed the many difficulties involved in assessing the full incidence of mental disorder of various kinds among the whole population, and surveyed the most significant studies on this topic. Some emphasis was placed, in the discussion, on the influence of geographical location and social environment upon mental disease.

In the last paper of the Symposium, Professor Freedman gave a list of the available gross reproduction rates and other measures of fertility for the economically emergent countries. The reproduction rate varied from 2.1 in Chile to 4.2 in the Cocos Islands. He discussed the significance of these figures and the effects of "emergence" upon them, showing how the norms for family size were adapted to conditions of high mortality, and that as mortality fell the norms tended to adjust themselves. But the

complete social life of a tribe or nation, and the role of everyone in it, was involved, and the transition could hardly be a rapid one.

The Symposium was fittingly concluded by the distinguished American demographer, Professor Notestein, who is the President of the Population Council, founded in the United States in 1952. He stressed the need for more demographic research, more money to promote it and more collaboration between natural and social scientists.

Now that three hundred years of demography have been celebrated, what of the future? The prospects have been surveyed in an article in the October 1962 issue of *Population Index* the quarterly published by the Office of Population Research at Princeton University and the Population Association of America. The article foresees that demands for demographic information and studies will increase and that the real need for these services will grow even faster in the emergent countries than the services themselves. This seems a reasonable expectation, as also does the suggestion that an increasing proportion of research effort will be devoted towards questions that relate to social, economic and population policy, and less to theory. It does seem likely, and desirable, that the trend away from abstraction and towards a detailed examination of the relevant facts, which has already transformed some branches of the subject, should extend itself to embrace the question of interrelations between economic and demographic development. These interrelations are evidently vital for the whole future of mankind, because they will determine how soon the present harmful explosion of population can be harnessed. The article refers to this movement towards the measurement of new factors and suggests also that the demographer will combine his services more and more with those of the sociologist, the psychologist and the economist, perhaps even performing these roles himself as well.

All these reasonable projections into the future represent continuations of current trends. But fortunately the possibility cannot be excluded that another Graunt will arise to discover things hitherto unimagined and so completely transform the course of demographic science.